In the claims:

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1. (original) A method for controlling a transmission rate of packets in response to a calculated ~~determining a~~ drop probability of the packets at a queue in a receiving node includes the steps of~~:, the method comprising~~:

systematically calculating a weight for determining a weighted moving average fullness of ~~a~~ the queue in a node;

calculating the weighted moving average;

determining an average queue size based upon the weighted moving average; and

evaluating a control function using the average queue size, the control function defining a drop behavior of packets at the node as for a range of average queue sizes as defined by a congestion control process executing at the node to determine the drop probability with regard to the average queue size; and

controlling the sending rate of the packets by feeding the calculated drop probability back to the sender.

2. (original) The method according to claim 1, wherein systematically calculating a weight comprises:

determining a sampling period for measuring the queue size;

determining a time period for which samples significantly contribute to the average queue size; and

determining the weight based upon the sampling period and the time period.

3. (currently amended) The method of claim 1, wherein ~~determining~~ evaluating a control function comprises:

determining a queue function based upon predetermined system parameters; and

determining the control function based upon the queue function.

4. (currently amended) The method according to claim 3 wherein determining the control function further comprises:

selecting a queue policy;

determining a threshold value based upon the selected queue policy;

determining a maximum point based upon the threshold value, wherein the maximum point is outside of the queue function;

selecting the control function such that when the control function is evaluated a point passes through the maximum point.

5. (original) The method according to claim 4 wherein the queue policy is a delay conservative policy and wherein determining a threshold value comprises:

determining a maximum value for the average queue size.

6. (original) The method according to claim 4 wherein the queue policy is a drop conservative policy and wherein determining a threshold value comprises:

determining a maximum value for the drop probability.

7. (currently amended) A method for reducing oscillations in queue size in a link using a congestion control process that operates in a TCP environment, the method comprising:

determining a queue law function defining an ~~the~~ average queue size for a link; based at least upon ~~the variable of~~ a drop probability characteristic of the congestion control process~~;~~

defining a control function for the queue which ~~determines~~ identifies a ~~the~~ drop probability of the congestion control process ~~based upon~~ across a range of average queue sizes ~~the average queue size wherein a bounding point for the control function defining a maximum value of drop probability and a maximum value of the average queue size is greater than an equivalent point on the queue law function for either the maximum value of the average queue size or the maximum value of the average drop probability~~; and

dropping packets from the queue at a packet drop rate ~~based upon a packet drop rate~~ defined at a point of intersection for the control function and the queue law function.

8. (original) The method according to claim 7, wherein the step of defining the control function, the control function is further defined as a function having no discontinuities.

9. (Currently amended) The method according to claim 7, wherein the control function is piecewise linear.

10. (currently amended) A method for increasing utilization of a link capable of receiving a number of flows into a buffer, the link residing in a TCP network, the link having a congestion control module which drops packets to avoid buffer overflow; the method comprising:

determining a quality representative of a capacity for the link;

calculating a quantity representative of the throughput for the link;

determining the utilization based on the capacity of the link, the throughput of the link, the numbers of flows and a packet drop probability calculated based on an average queue size and control function associated with a congestion control process of the link; and

automatically adjusting the packet drop probability to maintain a desired ~~increase the~~ utilization of the link .

11. (Currently amended) A method for execution a congestion control process in server having a queue which resides in a network wherein each data transmission from a sender to a receiver is sent at a transmission rate and the data transmission is acknowledged by the receiver, wherein if the data transmission is not acknowledged, ~~by~~ the sender reduces the transmission rate, the method comprising:

ascertaining a network function which ~~represents~~ defines an average queue size of the queue based upon a server drop rate;

determining a control function for the server which ~~produces an average queue size based upon~~ defines a given server drop rate for a range of average queue sizes for a given congestion control process;

calculating an equilibrium point based upon the intersection of the network function and control function; and

setting the drop rate of the server to the equilibrium point.

12. (Currently amended) An apparatus for controlling a transmission rate of packets issued by a sender in response to a calculated ~~determining a~~ drop probability, the apparatus comprising:

a buffer for receiving data into a node, the buffer forming a queue;

a weight module for systematically calculating a weight for determining a weighted moving average of the queue in a node;

a queue estimator for calculating the weighted moving average based on the weight and the received data in the queue and determining an average queue size based upon the weighted moving average; ~~and~~

a processor for evaluating a control function using the average queue size to determine the drop probability; and

a feedback mechanism for forwarding the determined drop probability to the sender to control the sender's transmission of packets such that a desired drop probability is attained.

13. (original) The apparatus according to claim 12, wherein the weight module:

determines the weight by first accessing a sampling period for measuring the queue size and a time period for which samples significantly contribute to the average queue size.

14. (original) The apparatus according to claim 12, further comprising:

a configuration module for determining a queue function based upon predetermined system parameters and determining the control function based upon the queue function.

15. (Currently amended) An apparatus for reducing oscillations in queue size in a link using a congestion control process that operates in a TCP environment, the method comprising:

a queue law module for determining a queue law function based on system parameters, the queue law function defining the average queue size for a link based at least upon ~~the~~ a ~~variable of~~ drop probability of the congestion control process;

a control function module defining a control function which ~~determines~~ defines the drop probability of the congestion control process for a range of average queue sizes ~~based upon the average queue size wherein a bounding point for the control function defining a maximum value~~

~~of the drop probability and a maximum value of the average queue size is greater than an equivalent point on the queue law function for either the maximum value of the average queue size or the maximum value of the average drop probability~~; ~~and~~

a processor for dropping packets from the queue based upon a packet drop rate defined at a point of intersection ~~for~~ of the control function and the queue law function.

16. (currently amended) An apparatus for reducing oscillations in queue size in a link using a congestion control process that operates in a TCP environment, the apparatus comprising:

a configuration module for ~~systematically~~ automatically determining control function configuration parameters based upon traffic characteristics;

a control function module receiving the control function configuration parameters which define a control function representing a range of packet drop probabilities across a range of queue sizes using the congestion control process and receiving an estimated queue size, the estimated queue size used in conjunction with the defined control function to determine a drop probability; and

a processor for dropping packets from the queue based upon a packet drop rate selected in accordance with the drop probability, wherein the packet drop rate is automatically updated in response to changing traffic characteristics.

17. (currently amended) A computer program product for controlling a transmission rate of packets issued by a sender in response to a calculated ~~determining a~~ drop probability, wherein the computer program product has computer code on a computer readable medium, the computer code comprising:

computer code for systematically calculating a weight for determining a weighted moving average of a queue in a node;

computer code for calculating the weighted moving average;

computer code for determining an average queue size based upon the weighted moving average; ~~and~~

computer code for evaluating a control function based on a congestion control process executing at the node, the control function defining a range of drop probabilities for a range of

average queue sizes responsive to the congestion control process; using the average queue size to determine the drop probability; and

computer code providing a feedback mechanism for forwarding the determined drop probability to the sender to control the sender's transmission of packets such that a desired drop probability is attained.

18. (original) The computer program product according to claim 17, wherein the computer code for systematically calculating a weight comprises:

computer code for determining a sampling period for measuring the queue size;

computer code for determining a time period for which samples significantly contribute to the average queue size; and

computer code for determining the weight based upon the sampling period and the time period.

19. (original) The computer program product according to claim 17, wherein the computer code for determining a control function comprises:

computer code for determining a queue function based upon predetermined system parameters; and

computer code for determining the control function based upon the queue function.

20. (original) The computer program product according to claim 19 wherein the computer code for determining the control function further comprises:

computer code for selecting a queue policy;

computer code for determining a threshold value based upon the selected queue policy computer code for determining a maximum point based upon the threshold value, wherein the maximum point is outside of the queue function computer code for selecting the control function such that when the control function is evaluated a point passes through the maximum point.

21. (Currently amended) The computer program product according to claim ~~so~~ 20 wherein the queue policy is a delay conservative policy and wherein the computer code for determining a threshold value comprises:

computer code for determining a maximum value for the average queue size.

22. (currently amended) The computer program product according to claim ~~21~~ 20 wherein the queue policy is a drop conservative policy and wherein the computer code for determining a threshold value comprises:

computer code for determining a maximum value for the drop probability.

23. (currently amended) A computer program product for reducing oscillations in queue size in a node using a congestion control process that operates in a TCP environment, wherein the computer program product has computer code on a computer readable medium, the computer code comprising:

computer code for determining a queue law function defining a range of packet drop probabilities across a range of queue sizes using the congestion control process ~~defining the average queue size for a link based at least upon the variable of drop probability~~;

computer code for defining a control function which ~~determines~~ defines a ~~the~~ drop probability for a range of average queue sizes; ~~based upon the average queue size wherein a bounding point for the control function defining a maximum value of the drop probability and a maximum value of the average queue size is greater than an equivalent point on the queue law function for either the maximum value of the average queue size or the maximum value of the average drop probability;~~ and

computer code for selecting a packet drop rate equal in response to the packet drop probability ~~dropping packets from the queue based upon a packet drop rate~~ defined at a point of intersection ~~for~~ of the control function and the queue law function.

24. (original) The computer program product according to claim 23, wherein the computer code for defining the control function, the control function is further defined as a function having no discontinuities.

25. (original) The computer program product according to claim 23, wherein the function is piecewise linear.

26. (Currently amended) A computer program product for increasing utilization of a link capable of receiving a number of flows into a buffer, the link residing in a TCP network, the link having a congestion control module which drops packets to avoid buffer overflow according to a congestion control process, wherein the computer program product has computer code on a computer readable medium, the computer code comprising:

computer code for determining a quantity representative of a capacity for the link;

computer code for calculating a quantity representative of the throughput for the link;

computer code for determining the utilization based on the capacity of the link, the throughput the link, the number of flows and a packet drop probability associated with the congestion control process; and

computer code for automatically adjusting the packet drop probability to ~~increase the~~ maintain a desired utilization of the link.

27. (Currently amended) A computer product for executing a congestion control process in a server having a queue which resides in a network wherein each data transmission from a sender to a receiver is sent at a transmission rate and the data transmission is acknowledged by the receiver, wherein if the data transmission is not acknowledged the sender reduces the transmission rate, wherein the computer program product has computer code on a computer readable medium, the computer code comprising:

computer code for ascertaining a network function which ~~represents~~ defines an average queue size of the queue based upon a range of server drop rates for the congestion control process;

computer code for determining a control function for the server which defines ~~produces~~ an average queue size based upon a range of given server drop rates;

computer code for calculating an equilibrium point based upon the intersection of the network function and control function; and

On page 8, please replace the paragraph spanning lines 22-30 with the following:

Based on aforementioned assumptions, the queue law =G(p) is determined (where q is the average size of the queue and p is the drop probability). Since the link between A and B is the only possible point of congestion, the average round trip time of a packet is the sum of the average waiting time in the queue of node B and R_0, the propagation and the round-trip transmission time outside the node. Assuming a FIFO (First ~~and~~ In First Out) queuing scheme, the average waiting time in the queue is q/c and the overall round trip time for a packet is the sum of the average waiting time in the queue and the propagation and transmission time on the rest of the round trip so that $R=R_0 + q/c$.

On page 10, please replace the paragraph spanning lines 1-6 with the following:

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not a complete Paragraph

which for a dial-up modem in a wide area network is 28.8Kb/s for τ_{min} and 56Kb/s for $\cancel{\tau_{min}}$ $\underline{\tau_{max}}$ however the speed of τ_{min} and τ_{max} for the connection is implementation dependent. Additional traffic characteristics include the minimum and maximum packet sizes (M_{min}, M_{max}), the minimum and maximum round trip time outside of the queue (R_{0min}, R_{0max}) the minimum and maximum drop probability outside of the queue (p_{0min}, p_{0max}) and the minimum and maximum TCP receiver window ($(W_{max})_{min}$, $(W_{max})_{max}$).

computer code for setting the drop rate of the server to the equilibrium point.